# Applications of Additively Manufactured Porous Media in Filtration, Flow Control, and Thermal Management

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## ABSTRACT

Conventional powder metallurgy techniques relying on compaction and sintering have been in use for decades to fabricate porous media for precision filtration and flow control devices. Mott Corporation has developed methods of fabricating porous metal media utilizing Additive Manufacturing. The AM approach opens the door for unique design geometries that are impossible to accomplish with conventional pressing-sintering methods. Additionally, gradient porosity structures and unique performance improvements have been realized under the additive development work. Mott uses laser powder bed fusion to generate filtration, flow control and thermal management media that exhibits nominal pore sizes covering ranges of sub-micron to 100+ microns. The enabling technology for this work is the open architecture of the additive equipment that supports discrete laser parameter adjustments. The ability to alter a wide array of laser parameters and build schemes not only helps fine tune the performance of the porous media, but it also greatly reduces the burden on the CAD file/slicing program itself. The work presented here discusses the pore structure development, impact of parameter settings on part performance, and highlights several studies where the printed porous media is used in real world applications.